

Effectiveness of the Current TFW Shade Methodology for Measuring Attenuation of Solar Radiation to the Stream

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In 2003, the Bull Trout Scientific Advisory Group, of the Forests and Fish Cooperative Monitoring, Evaluation and Research adaptive management program, implemented two connected studies designed to determine the effectiveness of the two eastern Washington riparian shade prescriptions in maintaining stream temperature. This presentation summarizes the methodology and the first field season of one of these studies: Effectiveness of the Current TFW Shade Methodology for Measuring Attenuation of Solar Radiation to the Stream. This study focuses on the effectiveness of the “all available shade” prescription that requires retention of all trees that contribute shade to fish-bearing streams within 75 feet of the stream, within the bull trout overlay area that identifies known and potential bull trout habitat. The primary working hypothesis for this study is that there is no significant difference in solar energy reaching the stream pre- and post-harvest when the “all available shade” rule is applied. Nine of 20 stream sites included in this study were surveyed in the summer of 2003. Adjoining reference and treatment reaches (300 meters each) were established on each stream, and solar radiation data were collected at 50 meter intervals by a 2-man crew working simultaneously within each reach. A mobile data collection approach was developed in which crews moved from station to station over the course of a single day, logging data for 5-8 minutes at each station. This resulted in 6-7 loops within each of the treatment and reference reaches over the course of a day. To ensure symmetry around solar noon, the timing of data collection was pre-programmed based on known solar elevations at a particular site. Solar radiation data collected within treatment and reference reaches were compared to data collected with the same type of instrumentation at a nearby, unobstructed hilltop site. Ratios of percent available radiation (PAR) were then developed for data collected at treatment and reference reaches. Average PAR for all sites sampled in 2003 ranged from 3 to 16 percent. Results from this solar portion of the study will be analyzed along with shade (densiometer), hemispherical photography, stream temperature, and riparian stand measurements conducted as part of the larger study.

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